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Owing to the lateness of the hour, the botanical paper of the evening, by Mr. Hollick, on the "Relation between Geological Formations and the Distribution of Plants," was merely read by title and handed to the Editor for publication in the BULLETIN.

§ 6. **Relations between Geological Formations and the Distribution of Plants.**—The notes, from which this paper was compiled were taken during the past season on Staten Island and are, therefore, very restricted and local in their nature; but even within such narrow limits, the effect which the geological formation seems to have on its accompanying flora is so marked, that it seems of vast importance, alike to the practical botanist in his collecting tours, and as a field of speculation for the theorist.

We have, on Staten Island, two well marked geological features —the *Drift*, which covers about two-thirds of the entire Island, nearly all the northern part and extending as far south as Princes Bay, and the *Cretaceous*, which occupies the remaining small area in the southern and western part. This latter is a continuation of the New Jersey clay beds.

The geological line of separation between the two formations is not always very distinct, but the limits of the different species of plants mark it in unmistakeable characters. The two floras are remarkably distinct. That one belonging to the Cretaceous is well represented by *Arctostaphylos Uva-ursi*, *Aster concolor*, *Pinus inops*, *Quercus Phellos*, *Quercus nigra*, *Lycopodium inundatum*, *var. Bigelovii*, and many more of the Pine Barren plants. Thus far I have never found one of these species to have crossed the line of the Drift, but in their stead will be found *Pinus rigida*, *Quercus alba*, *Quercus rubra*, etc., and the majority of those plants which grow in the vicinity of New York Island, and up the Hudson.

Those plants which belong to the Drift seem to adapt themselves more readily to the Cretaceous than "vice versa," for while we find *Quercus alba* and *Pinus rigida* growing in Cretaceous clays and sands, the *Quercus Phellos* and *Pinus inops* have never been seen out of their natural geological location. The same may also be said of the more northern species of *Aster*, which occur quite plentifully with *Aster concolor*, but this latter will not spread beyond the Cretaceous. It would be interesting to know if these facts hold good in other localities. It almost seems as if the Drift flora were gaining on the Cretaceous and gradually crowding it off the Island.

A curious and interesting case of restricted locality, due apparently to geological causes, is seen in *Clematis ochroleuca*, which only grows on the dry hills of magnesian rocks which form the main ridge of the Island and in the vicinity of the Limonite ore deposits.—It is accompanied by *Cerastium oblongifolium*, which likewise seems equally restricted. Do these same conditions prevail in other localities where these comparatively rare plants occur?—In an isolated hammock of soapstone and iron ore, fully three-fourths of a mile away from the ridge, and having no intermediate connections, *Clematis ochroleuca* was found. Probably by others, who have had a wider area for research, many more instances of a similar nature may have been noted, as for example the well known restriction of *Camptosorus rhizophyllus* to the vicinity of limestone cliffs.

When the effects of the geological formation on the distribution of plants and the relations between them are better known, it will certainly facilitate the efforts of the collector by directing him to localities where the geological formation is similar to that of known districts, and where he may reasonably infer that the flora will be also in keeping; provided, of course, that there is not too great a diversity in climate and physiographic conditions.

Within a radius of perhaps 50 miles it would be reasonable to expect that similar geological conditions would afford similar floras.

Port Richmond, S. I. ARTHUR HOLLICK.

[As regards *Camptosorus* we may state that, according to our own observations, the plant is not exclusively calcicolous; it is not rare in the Hudson River Valley on the slates and shales of the Hudson River Group. And we may say the same of *Asplenium Ruta-muraria ;* which also is usually described as one of the lime-rock ferns.—EDS.]

Setaria glauca, Beauv. and **S. viridis,** Beauv.—Last Summer I collected indiscriminately, and from many localities, specimens of *Setaria.* During this Winter I analyzed about 15 of them under the microscope and found only *one* specimen of the *S. viridis !*—Is the *S. glauca* so much the commoner of the two, or was this only accidental?

A. H.

§ 7. **Bryological Notes,** by C. F. AUSTIN.

Sphagnum macrophylum, BERNHARDI *Var.* **Floridanum,** AUST. —Differs from the typical form, as described and figured in Sulliv. Icon. p. 1. t. I., and as represented in various exsiccati, in its lurid green, or often albescent color ; but chiefly in the areolae of the leaves being about twice as long and furnished with 40–70 *extremely minute pores, in two rows.*—A remarkable var. Hab. Florida.

Sphagnum cuspidatum, EHRT., *Var.* **serratum,** AUST.—*Sphagnum serratum,* AUST., this Journal, vol. vi., p. 245 ; also Musc. Appalach. Suppl n. 453.—Specimens collected by Capt. Smith about Lake Harris, Fla., last spring, show pretty conclusively that this is only a remarkable form of *Sph. cuspidatum ;* only the leaves on the uppermost branches being decidedly serrate.

Bruchia Sullivanti, AUST., *Var.* **microtheca.**—Form and texture of the leaves normal ; but the plants are much smaller than usual. The capsule is about half the usual size and of a fine light brown color, with a remarkably short collum usually passing insensibly into the pedicel, which is geniculate when moist and straight when dry. Sporangium round-oval, twice the length of the collum. Spores among the smallest of the genus, or about 1-1,000 of an inch in diameter, *not papillose but very minutely granulose.* Inflorescence for the most part antoicous, Hampden Co. Va. Apr., 1878. J. D. S.

DONNELLIA, nov. gen.

Donnellii Floridana, AUST., *Fabronia Donnellii,* AUST., *in Bot. Gazette,* vol. ii., p. 111.—" Folis oblongo-lanceolatis strictiusculis nonnunquam submarginatis obsolete serrulatis fere ecostatis, cellulis perangustis, basilaribus majoribus subquadratis inflatis ; capsula ovali